IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS:	Fitzgerald		
SERIAL NO.:	10/022,689	GROUP NO.:	2813
FILING DATE:	December 17, 2001	EXAMINER:	Laura M. Schillinger
TITLE:	CONTROLLING THREADING DISLOCATION DENSITIES IN GE ON SI USING GRADED GESI LAYERS AND PLANARIZATION		

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Sir:

In accordance with the provisions of 37 C.F.R. 1.97 and 1.98, Applicants hereby make of record the patents and publications listed on the accompanying Form PTO-1449, and other information contained herein, for consideration by the Examiner in connection with the examination of the above-identified patent application. Copies of the patents and publications are enclosed.

REMARKS

In accordance with the provisions of 37 C.F.R. 1.97, this statement is being filed (CHECK ONE):

☐ (1) within three (3) months of the **filing date** of a national application other than a continued prosecution application under 37 C.F.R. 1.53(d), or within three (3) months of the **date of entry of the national stage** as set forth in 37 C.F.R. 1.491 in an international application, or before the mailing of the **first Office action** on the merits, or before the mailing of a **first Office action** after the filing of a request for continued examination under 37 C.F.R. 1.114; or

☒ (2) after the period defined in (1) but before the mailing date of a **final action** or a **notice of allowance** under 37 C.F.R. 1.311, and

☐ the requisite Statement is below, **OR**

☒ the requisite fee under 37 C.F.R. 1.17(p), namely **$180.00**, is included herein, or

☐ (3) after the mailing date of a **final action** or **notice of allowance** but before the payment of the **issue fee, AND**

☐ the requisite Statement is below, **AND**

☐ the requisite petition fee under 37 C.F.R. 1.17(p), namely **$180.00** is included herein.

In addition, Applicant wishes to inform the Examiner about the following co-pending patent applications, publications, issued patents, and Office Actions issued therein:

U.S. Serial No. 10/264,935, filed on October 4, 2002, by Lochtefeld et al.;

U.S. Serial No. 10/456,708, filed on 06/06/2003, by Lochtefeld et al.;

U.S. Serial No. 10/456,103, filed on 06/06/2003, by Lochtefeld et al.;

U.S. Publication No. 2003-0102498-A1, published 06/05/2003, by Braithwaite et al.;

U.S. Serial No. 10/389,003, filed 03/14/2003, by Fitzgerald;

U.S. Patent No. 6,107,653, issued 08/22/2000, by Fitzgerald;

U.S. Patent No. 6,291,321, issued 09/18/2001, by Fitzgerald;

U.S. Serial No. 09/611,024, filed 07/06/2000, by Fitzgerald;

U.S. Patent No. 6,573,126, issued 06/03/2003, by Cheng et al.;

U.S. Serial No. 10/384,160, filed 03/07/2003, by Cheng et al.;

U.S. Serial No. 10/379,355, filed 03/04/2003, by Cheng et al.;

U.S. Patent No. 6,602,613, issued 08/05/2003, by Fitzgerald;

U.S. Serial No. 10/391,086, filed on 03/18/2003, by Fitzgerald;

U.S. Serial No. 09/764,177, filed on 01/07/2001, by Fitzgerald;

U.S. Publication No. 2002-0100942 A1, published 08/01/2002, by Fitzgerald et al.;

U.S. Publication No. 2002-0125471, published 09/12/2002, by Fitzgerald et al.;

U.S. Publication No. 2003-0034529, published 02/20/2003, by Fitzgerald et al.;

U.S. Serial No. 10/625,018, filed 07/23/2003, by Fitzgerald et al.;

U.S. Publication No. 2002-0123197, published 07/05/2002, by Fitzgerald et al.;

U.S. Serial No. 10/611,739, filed 07/01/2003, by Fitzgerald et al.;

U.S. Publication No. 2002-0125497, published 09/12/2002, by Fitzgerald;

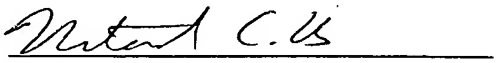
U.S. Serial No. 09/906,545, filed on 07/16/2001, by Fitzgerald;

U.S. Serial No. 09/906,200, filed 07/16/2001, by Fitzgerald; and

U.S. Publication No. 2003-0077867, published 07/24/2003, by Fitzgerald.

It is respectfully requested that each of the patents and publications listed on the attached Form PTO-1449, and other information contained herein, be made of record in this application.

Respectfully submitted,



Natasha C. Us
Attorney for the Applicant
Testa, Hurwitz, & Thibeault, LLP
High Street Tower
125 High Street
Boston, Massachusetts 02110

Date: August 13, 2003
Reg. No. 44,381

Tel. No.: (617) 310-8327
Fax No.: (617) 248-7100

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FORM PTO - 1449 SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT	ATTY DOCKET NO.: ASC-023DVC2 APPLICANTS: Fitzgerald SERIAL NO.: 10/022,689 FILING DATE: December 17, 2001 GROUP: 2813

U.S. PATENT DOCUMENTS

EXAM. INIT.		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPROPRIATE
	A1	4,010,045	03/01/1977	Ruehrwein			
	A2	4,710,788	12/01/1987	Dambkes et al.			
	A3	4,987,462	01/22/1991	Kim et al.			
	A4	4,990,979	02/05/1991	Otto			
	A5	5,013,681	05/07/1991	Godbey et al.			
	A6	5,155,571	10/13/1992	Wang et al.			
	A7	5,166,084	11/24/1992	Pfiester			
	A8	5,202,284	04/01/1993	Kamins et al.			
	A9	5,207,864	05/04/1993	Bhat et al.			
	A10	5,208,182	05/04/1993	Narayan et al.			
	A11	5,212,110	05/18/1993	Pfiester et al.			
	A12	5,221,413	06/22/1993	Brasen et al.			
	A13	5,241,197	08/31/1993	Murakami et al.			
	A14	5,285,086	02/08/1994	Fitzgerald, Jr.			
	A15	5,291,439	03/01/1994	Kauffmann, et al.			
	A16	5,310,451	05/10/1994	Tejwani et al.			
	A17	5,316,958	05/31/1994	Meyerson			
	A18	5,346,848	09/13/1994	Grupen-Shemansky et al.			
	A19	5,374,564	12/20/1994	Bruel			
	A20	5,413,679	05/09/1995	Godbey			
	A21	5,426,069	06/20/1995	Selvakumar et al.			
	A22	5,426,316	06/20/1995	Mohammad			
	A23	5,461,243	10/24/1995	Ek et al.			
	A24	5,461,250	10/24/1995	Burghartz et al.			
	A25	5,462,883	10/31/1995	Dennard et al.			
	A26	5,476,813	12/19/1995	Naruse			
	A27	5,479,033	12/26/1995	Baca et al.			
	A28	5,484,664	01/16/1996	Kitahara et al.			
	A29	5,523,243	06/04/1996	Mohammad			
	A30	5,523,592	06/04/1996	Nakagawa et al.			

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EXAM. INIT.		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPROPRIATE
	A31	5,536,361	07/16/1996	Kondo et al.			
	A32	5,540,785	07/30/1996	Dennard et al.			
	A33	5,596,527	01/12/1997	Tomioka, et al.			
	A34	5,617,351	04/01/1997	Bertin, et al.			
	A35	5,683,934	11/04/1997	Candelaria			
	A36	5,698,869	12/16/1997	Yoshimi et al.			
	A37	5,728,623	03/17/1998	Mori			
	A38	5,739,567	04/14/1998	Wong			
	A39	5,759,898	06/02/1998	Ek et al.			
	A40	5,777,347	07/07/1998	Bartelink			
	A41	5,786,612	07/28/1998	Otani et al.			
	A42	5,786,614	07/28/1998	Chuang, et al.			
	A43	5,792,679	08/11/1998	Nakato			
	A44	5,808,344	09/15/1998	Ismail et al.			
	A45	5,847,419	12/08/1998	Imai et al.			
	A46	5,877,070	03/02/1999	Goesele et al.			
	A47	5,906,708	05/25/1999	Robinson et al.			
	A48	5,912,479	06/15/1999	Mori et al.			
	A49	5,943,560	08/24/1999	Chang et al.			
	A50	5,963,817	10/05/1999	Chu et al.			
	A51	5,966,622	10/12/1999	Levine et al.			
	A52	5,998,807	12/07/1999	Lustig et al.			
	A53	6,013,134	01/11/2000	Chu et al.			
	A54	6,033,974	03/07/2000	Henley et al.			
	A55	6,033,995	03/07/2000	Muller			
	A56	6,058,044	05/02/2000	Sugiura et al.			
	A57	6,074,919	06/13/2000	Gardner et al.			
	A58	6,096,590	08/01/2000	Chan et al.			
	A59	6,103,559	08/15/2000	Gardner et al.			
	A60	6,111,267	08/29/2000	Fischer et al.			

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EXAM. INIT.		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPROPRIATE
	A61	6,117,750	09/12/2000	Bensahel et al.			
	A62	6,130,453	10/10/2000	Mei, et al.			
	A63	6,133,799	10/17/2000	Favors, Jr., et al.			
	A64	6,140,687	10/31/2000	Shimomura et al.			
	A65	6,143,636	11/07/2000	Forbes, et al.			
	A66	6,153,495	11/28/2000	Kub et al.			
	A67	6,154,475	11/28/2000	Soref et al.			
	A68	6,160,303	12/12/2000	Fattaruso			
	A69	6,162,688	12/19/2000	Gardner et al.			
	A70	6,184,111	02/06/2001	Henley et al.			
	A71	6,191,007	02/20/2001	Matsui et al.			
	A72	6,191,432	02/20/2001	Sugiyama et al.			
	A73	6,194,722	02/27/2001	Fiorini et al.			
	A74	6,204,529	03/20/2001	Lung, et al.			
	A75	6,207,977	03/01/2001	Augusto			
	A76	6,210,988	04/03/2001	Howe et al.			
	A77	6,218,677	04/17/2001	Broekaert			
	A78	6,232,138	05/15/2001	Fitzgerald et al.			
	A79	6,235,567	05/22/2001	Huang			
	A80	6,242,324	06/05/2001	Kub et al.			
	A81	6,249,022	06/19/2001	Lin, et al.			
	A82	6,251,755	06/26/2001	Furukawa et al.			
	A83	6,261,929	07/01/2001	Gehrke et al.			
	A84	6,266,278	07/24/2001	Harari, et al.			
	A85	6,271,551	08/07/2001	Schmitz et al.			
	A86	6,271,726	08/07/2001	Fransis et al.			
	A87	6,313,016	11/06/2001	Kibbel et al.			
	A88	6,316,301	11/13/2001	Kant			
	A89	6,323,108	11/27/2001	Kub et al.			
	A90	6,329,063	12/11/2001	Lo et al.			

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EXAM. INIT.		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPROPRIATE
	A91	6,335,546	01/01/2002	Tsuda et al.			07/30/1999
	A92	6,339,232	01/15/2002	Takagi			09/20/1999
	A93	6,368,733	04/09/2002	Nishinaga			08/05/1999
	A94	6,372,356	04/16/2002	Thornton et al.			04/028/2000
	A95	6,399,970	06/04/2002	Kubo et al.			09/16/1997
	A96	6,407,406	06/18/2002	Tezuka			06/29/1999
	A97	6,425,951	07/30/2002	Chu et al.			08/06/1999
	A98	6,429,061	08/06/2002	Rim			07/26/2000
	A99	6,420,937	07/16/2002	Akatsuka et al.			06/14/2001
	A100	6,521,041	02/18/2003	Wu et al.			04/09/1999
	A101	6,555,839	04/29/2003	Fitzgerald			05/16/2001
	A102	6,583,015	06/24/2003	Fitzgerald et al.			08/06/2001
	A103	6,521,041	02/18/2003	Wu et al.			04/09/1999
	A104	2001/0003364	06/14/2001	Sugawara et al.			12/08/2000
	A105	2002/0043660	04/18/2002	Yamazaki et al.			06/25/2001
	A106	6,593,191	07/15/2003	Fitzgerald			05/16/2001
	A107	6,573,126	06/03/2003	Cheng et al.			08/10/2001
	A108	2002/0096717	07/25/2002	Chu et al.			01/25/2001
	A109	2002/0100942	08/01/2001	Fitzgerald et al.			06/19/2001
	A110	2002/0123167	09/05/2002	Fitzgerald			07/16/2001
	A111	2002/0123183	09/05/2002	Fitzgerald			07/16/2001
	A112	2002/0123197	09/05/2002	Fitzgerald et al.			06/19/2001
	A113	2002/0125471	09/12/2002	Fitzgerald et al.			12/04/2001
	A114	2002/0125497	09/12/2002	Fitzgerald			07/16/2001
	A115	6,603,156	08/05/2003	Rim			03/31/2001
	A116	2003/0003679	01/02/2003	Doyle et al.			06/29/2001

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FOREIGN PATENT DOCUMENTS

EXAM. INIT.		DOCUMENT NUMBER	DATE	COUNTRY CODE	CLASS	SUB CLASS	FILING DATE	ABSTRACT ONLY	ENGLISH LANG (Y/N)
	B1	41 01 167	07/23/1992	DE				NO	NO
	B2	0 587 520	03/16/1994	EP				NO	YES
	B3	0 683 522	11/22/1995	EP				NO	YES
	B4	0 828 296	03/11/1998	EP				NO	YES
	B5	0 829 908	03/18/1998	EP				NO	YES
	B6	0 838 858	04/29/1998	EP				NO	NO
	B7	1 020 900	07/19/2000	EP				NO	YES
	B8	1 174 928	01/23/2002	EP				NO	YES
	B9	2 342 777	04/19/2000	GB				YES	YES
	B10	10-270685	10/09/1998	JP				NO	YES
	B11	11-233744	08/27/1999	JP				NO	NO
	B12	2000-021783	08/31/2000	JP				NO	YES
	B13	2000-031491	01/28/2000	JP				NO	NO
	B14	2001-319935	11/16/2001	JP				NO	YES
	B15	2002-076334	03/15/2002	JP				NO	YES
	B16	2002-164520	06/07/2002	JP				NO	YES
	B17	2002-289533	10/04/2002	JP				NO	YES
	B18	4-307974	10/30/1992	JP				NO	NO
	B19	5-166724	07/02/1993	JP				NO	Abstract Only
	B20	6-177046	06/24/1994	JP				NO	Abstract Only
	B21	7-106446	04/21/1995	JP				NO	NO
	B22	7-240372	09/12/1995	JP				NO	Abstract Only
	B23	00/48239	08/17/2000	WO				NO	YES
	B24	00/54338	09/14/2000	WO				NO	YES

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FOREIGN PATENT DOCUMENTS

EXAM. INIT.		DOCUMENT NUMBER	DATE	COUNTRY CODE	CLASS	SUB CLASS	FILING DATE	ABSTRACT ONLY	ENGLISH LANG (Y/N)
	B25	01/022482	03/29/2001	WO				NO	YES
	B26	01/54202	07/26/2001	WO				NO	YES
	B27	01/93338	12/06/2001	WO				NO	YES
	B28	01/99169	12/27/2001	WO				NO	YES
	B29	02/071488	09/12/2002	WO				NO	YES
	B30	02/071491	09/12/2002	WO				NO	YES
	B31	02/071495	09/12/2002	WO				NO	YES
	B32	02/082514	10/17/2002	WO				NO	YES
	B33	02/13262	02/14/2002	WO				NO	YES
	B34	02/15244	02/21/2002	WO				NO	YES
	B35	02/27783	04/04/2002	WO				NO	YES
	B36	02/47168	06/13/2002	WO				NO	YES
	B37	98/59365	12/30/1998	WO				NO	YES
	B38	99/53539	10/21/1999	WO				NO	YES
	B39	6-252046	11/19/1992	JP				NO	YES

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FORM PTO – 1449 SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT	ATTY DOCKET NO.: ASC-023DVC2 APPLICANTS: Fitzgerald SERIAL NO.: 10/022,689 FILING DATE: December 17, 2001 GROUP: 2813

OTHER ART, JOURNAL ARTICLES, ETC.

EXAM. INIT.	OTHER DOCUMENTS: (Including Author, Title, Date, Relevant Pages, Place of Publication)	
	C1	Armstrong et al., "Design of Si/SiGe Heterojunction Complementary Metal-Oxide-Semiconductor Transistors," IEDM Technical Digest (1995 International Electron Devices Meeting) pp. 761-764.
	C2	Armstrong, "Technology for SiGe Heterostructure-Based CMOS Devices", PhD Thesis, Massachusetts Institute of Technology, 1999, pp. 1-154.
	C3	Augusto et al., "Proposal for a New Process Flow for the Fabrication of Silicon-based Complementary MOD-MOSFETs without ion Implantation," Thin Solid Films, vol. 294, no. 1-2, pp. 254-258 (February 15, 1997).
	C4	Barradas et al., "RBS analysis of MBE-grown SiGe/(001) Si heterostructures with thin, high Ge content SiGe channels for HMOS transistors," Modern Physics Letters B (2001) (abstract).
	C5	Borenstein et al., "A New Ultra-Hard Etch-Stop Layer for High Precision Micromachining," Proceedings of the 1999 12th IEEE International Conference on Micro Electro Mechanical Systems (MEMs) (January 17-21, 1999) pp. 205-210.
	C6	Bouillon et al., "Search for the optimal channel architecture for 0.18/0.12 μm bulk CMOS Experimental study," IEEE, (1996) pp. 21.2.1-21.2.4.
	C7	Bruel et al., "®SMART CUT: A Promising New SOI Material Technology," Proceedings 1995 IEEE International SOI Conference (October 1995) pp. 178-179.
	C8	Bruel, "Silicon on Insulator Material Technology," Electronic Letters, Vol. 13, No. 14 (July 6, 1995) pp. 1201-1202.
	C9	Bufler et al., "Hole transport in strained Si1-xGex alloys on Si1-yGey substrates," Journal of Applied Physics, Vol. 84, No. 10 (November 15, 1998) pp. 5597-5602.
	C10	Burghartz et al., "Microwave Inductors and Capacitors in Standard Multilevel Interconnect Silicon Technology", IEEE Transactions on Microwave Theory and Techniques, Vol. 44, No. 1, January 1996, pp. 100-104.
	C11	Canaperi et al., "Preparation of a relaxed Si-Ge layer on an insulator in fabricating high-speed semiconductor devices with strained epitaxial films," International Business Machines Corporation, USA (2002) (abstract).
	C12	Carlin et al., "High Efficiency GaAs-on-Si Solar Cells with High Voc Using Graded GeSi Buffers," IEEE (2000) pp. 1006-1011
	C13	Chang et al., "Selective Etching of SiGe/Si Heterostructures," Journal of the Electrochemical Society, No. 1 (January 1991) pp. 202-204.
	C14	Cheng et al., "Electron Mobility Enhancement in Strained-Si n-MOSFETs Fabricated on SiGe-on-Insulator (SGOI) Substrates," IEEE Electron Device Letters, Vol. 22, No. 7 (July 2001) pp. 321-323.
	C15	Cheng et al., "Relaxed Silicon-Germanium on Insulator Substrate by Layer Transfer," Journal of Electronic Materials, Vol. 30, No. 12 (2001) pp. L37-L39.

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OTHER ART, JOURNAL ARTICLES, ETC.

EXAM. INIT.	OTHER DOCUMENTS: (Including Author, Title, Date, Relevant Pages, Place of Publication)	
	C16	Cullis et al, "Growth ripples upon strained SiGe epitaxial layers on Si and misfit dislocation interactions," Journal of Vacuum Science and Technology A, Vol. 12, No. 4 (July/August 1994) pp. 1924-1931.
	C17	Currie et al., "Carrier mobilities and process stability of strained S in- and p-MOSFETs on SiGe virtual substrates," J. Vac. Sci. Technol. B., Vol. 19, No. 6 (Nov/Dec 2001) pp. 2268-2279.
	C18	Eaglesham et al., "Dislocation-Free Stranski-Krastanow Growth of Ge on Si(100)," Physical Review Letters, Vol. 64, No. 16 (April 16, 1990) pp. 1943-1946.
	C19	Feijoo et al., "Epitaxial Si-Ge Etch Stop Layers with Ethylene Diamine Pyrocatechol for Bonded and Etchback Silicon-on-Insulator," Journal of Electronic Materials, Vol. 23, No. 6 (June 1994) pp. 493-496.
	C20	Fischetti et al., "Band structure, deformation potentials, and carrier mobility in strained Si, Ge, and SiGe alloys," J. Appl. Phys., Vol. 80, No. 4 (August 15, 1996) pp. 2234-2252.
	C21	Fischetti, "Long-range Coulomb interactions in small Si devices. Part II. Effective electronmobility in thin-oxide structures," Journal of Applied Physics, Vol. 89, No. 2 (January 15, 2001) pp. 1232-1250.
	C22	Fitzgerald et al., "Dislocation dynamics in relaxed graded composition semiconductors," Materials Science and Engineering B67, (1999) pp. 53-61.
	C23	Fitzgerald et al., "Relaxed GexSi1-x structures for III-V integration with Si and high mobility two-dimensional electron gases in Si," AT&T Bell Laboratories, Murray Hill, NJ 07974 (1992) American Vacuum Society, pp. 1807-1819
	C24	Fitzgerald et al., "Totally Relaxed GexSi1-x Layers with Low Threading Dislocation Densities Grown on Si Substrates," Applied Physics Letters, Vol. 59, No. 7 (August 12, 1991) pp. 811-813.
	C25	Garone et al., "Silicon vapor phase epitaxial growth catalysis by the presence of germane," Applied Physics Letters, Vol. 56, No. 13 (March 26, 1990) pp. 1275-1277.
	C26	Gray and Meyer, "Analysis and Design of Analog Integrated Circuits", John Wiley & Sons, 1984, pp. 605-632.
	C27	Grützmacher et al., "Ge segregation in SiGe/Si heterostructures and its dependence on deposition technique and growth atmosphere," Applied Physics Letters, Vol. 63, No. 18 (November 1, 1993) pp. 2531-2533.
	C28	Hackbarth et al., "Alternatives to thick MBE-grown relaxed SiGe buffers," Thin Solid Films, Vol. 369, No. 1-2 (July 2000) pp. 148-151.
	C29	Hackbarth et al., "Strain relieved SiGe buffers for Si-based heterostructure field-effect transistors," Journal of Crystal Growth, Vol. 201/202 (1999) pp. 734-738.
	C30	Herzog et al., "SiGe-based FETs: buffer issues and device results," Thin Solid Films, Vol. 380 (2000) pp. 36-41.
	C31	Höck et al., "Carrier mobilities in modulation doped Si1-xGex heterostructures with respect to FET applications," Thin Solid Films, Vol. 336 (1998) pp. 141-144.

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FORM PTO – 1449 SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT	ATTY DOCKET NO.: ASC-023DVC2 APPLICANTS: Fitzgerald SERIAL NO.: 10/022,689 FILING DATE: December 17, 2001 GROUP: 2813

OTHER ART, JOURNAL ARTICLES, ETC.

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	APPLICANTS:	Fitzgerald
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